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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,508	12/16/2005	Roberto Angelo Motterlini	H0817.70001US00	7230
23628 7590 01/05/2010 WOLF GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206				
EXAMINER				
SOROUSH, ALI				
ART UNIT		PAPER NUMBER		
1616				
MAIL DATE		DELIVERY MODE		
01/05/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/535,508

Applicant(s)

MOTTERLINI ET AL.

Examiner

ALI SOROUSH

Art Unit

1616

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10 and 16-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/28/2009 has been entered.

Status of the Claims

No new claim amendments have been submitted. Therefore, claims 1, 3-10 and 16-23 are currently pending examination for patentability.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Applicant Claims
2. Determining the scope and contents of the prior art.
3. Ascertaining the differences between the prior art and the claims at issue; and resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. The rejection of claims 1, 3-10, and 16-23 under 35 U.S.C. 103(a) as being unpatentable over Oeltgen et al. (US Patent 6645938 B2, Published 11/11/2003, Filed 01/10/2001) in view of Motterlini et al. (Carbon Monoxide-releasing Molecules Characterization of Biochemical and Vascular Activities, Circulation Research, Published 02/08/2002) **is maintained.**

Applicant Claims

Applicant claims a method of treatment of an extracorporeal organ or isolated organ comprising contacting said organ with a composition comprising a metal carbonyl compound wherein the metal carbonyl compound makes available carbon monoxide to limit post-ischemic damage to said organ.

Determination of the Scope and Content of the Prior Art (MPEP §2141.01)

Oeltgen et al. teach methods for "Protection against ischemia and reperfusion injury". (See title). "Tissues deprived of blood and oxygen undergo ischemic necrosis or infarction with possible irreversible organ damage. In some circumstances, however, such as during cardiac surgery, it is desirable to interrupt the normal myocardial contractions (cardioplegia) and actually induce ischemia." (See column 1, Lines 14-18). "The same problems also occur during organ storage for cardiac transplant, under which there are time constraints due to the limits of myocardial preservation." (See column 1, Lines 45-48). "In one embodiment, a method of protecting against ischemia

and reperfusion injury in a mammal is disclosed. An effective concentration of compound D SED ID NO:1 is administered to the mammal in a pharmaceutically acceptable formulation ... prior to ... substantially concurrent with ... during ... or post-ischemia. " (See column 2, Lines 17-25). "The invention is also directed to a method to prevent damage to an isolated organ, for example, a heart for transplant. The isolated organ is exposed to a preservative solution containing an effective amount of compound-D SED ID NO: 1." (See column 2, Lines 28-32).

***Ascertainment of the Difference Between Scope the Prior Art and the Claims
(MPEP §2141.012)***

Oeltgen et al. does not teach a preservative solution comprising a metal carbonyl compound which makes available carbon monoxide. This deficiency is cured by the teachings of Motterlini et al.

Motterlini et al. teaches $[\text{Ru}(\text{CO})_3\text{Cl}_2]_2$ freshly dissolved in DMSO (see page 19, column 2, paragraph 3) was added consecutively to aortic rings (see page 21, column 1, paragraph 2) which were isolated from male Lewis rats (see page 19, column 1, paragraph 5). Motterlini et al. teaches that $[\text{Ru}(\text{CO})_3\text{Cl}_2]_2$ freshly dissolved in DMSO releases CO into the solution. (See page 19, column 2, Paragraph 3). Motterlini et al. teaches that upon administration of light CO is released from Pentacarbonyl by the mechanism of photodissociation. (See page 19, column 2, Paragraph 3). Motterlini et al. teach that "transition metal carbonyls could be utilized for therapeutic delivery of CO to alleviate vascular- and immuno-related dysfunctions." (See abstract). Further, Motterlini et al. teach that CO releasing compounds have been found to be pivotal in the

defensive system against ischemia-reperfusion damage. (See page 17, column 1, paragraph 1).

***Finding of Prima Facie Obviousness Rational and Motivation
(MPEP §2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to combine the teachings of Oeltgen et al. with Motterlini et al. One would have been motivated to do so because Motterlini et al. teaches that the transition metal carbonyls taught are useful for defense against ischemia-reperfusion damage and therefore, adding such a compound to the solution taught by Oeltgen would enhance the protective activity of the solution. For the foregoing reasons, the instant method would have been obvious to one of ordinary skill in the art at the time of the instant invention.

Response to Applicant's Arguments

Applicant argues that Motterlini et al. does not teach or suggest that CO releasing compounds are pivotal in the defensive system against ischemia-reperfusion damage but rather teach HO-1 has such an activity. Applicant's argument has been fully considered but found not to be persuasive. It is the Examiners position that the Motterlini et al. teach that HO-1 results in the formation of CO and that it is pivotal in the protection of ischemic-reperfusion damage. Motterlini et al. further teach that the HO derived CO has cytoprotective activity. (See page 17, column 1, paragraph 1) It is the

Examiners position that these teachings indicate CO-releasing molecules in general have ischemia-reperfusion protective activity.

Applicant also argues that there is no motivation in Oeltgen et al. to either modify the peptide compound used in the preservative or use compounds other than the peptide compound. Furthermore, applicant argues that even there was some motivation to substitute the peptide compound with another compound, one of ordinary skill would not be motivated to use a carbon monoxide-releasing molecule as taught by Motterlini et al. Applicants arguments have been fully considered but found not be persuasive. Motterlini et al. teach that carbon monoxide-releasing compounds "represents a pivotal inducible defensive system against stressful stimuli, including ... ischemia-reperfusion damage ..." (See page 17, column 1, paragraph 1). Therefore, it is the Examiners position that one of ordinary skill in the art would be motivated to combine the carbon monoxide-releasing molecules of Motterlini et al. with the composition taught by Oeltgen et al. in order to give an additive effect of both the peptide molecule and the carbon monoxide-releasing molecule in protecting against ischemia-reperfusion damage.

Applicant finally argues that the instant invention is not related to a combination of compounds. Applicant's argument has been fully considered but found not to be persuasive. Applicant's claims are directed to a "method comprising" which reads on methods utilizing one or more agents including compound-D as taught by Oeltgen et al. For the foregoing reasons, the instant rejection of claims 1, 3-10, and 16-23 under 35 U.S.C. 103(a) is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ali Soroush whose telephone number is (571) 272-9925. The examiner can normally be reached on Monday through Thursday 8:30am to 5:00pm E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Johann Richter can be reached on (571) 272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ali Soroush
Patent Examiner
Art Unit: 1616

/Johann R. Richter/

Supervisory Patent Examiner, Art Unit 1616